REMARKS

Reconsideration and further examination of this application is hereby requested. Claims 1-26 and 30-35 are currently pending in the application. Claims 27-29 have been canceled.

Amendments have been made to claims 1, 7, 13, 19, 23, 25, 30, and 33 for the purpose of more clearly reciting the color assignment aspect of the invention. These changes do not narrow the claims and, if anything, broaden them slightly. These changes were not made to avoid any prior art, and in fact, it is noted that no prior art has been applied against the claims at this time.

Amendments have also been made to claims 23 and 24 to rectify latent indefiniteness by correcting antecedent basis errors and to re-cast those claims as "signal bearing medium" claims, as suggested by the Examiner, rather than as "propagated signals."

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached pages are captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE".

A. The Information Disclosure Statement

The mention of five "exhibits" in connection with the Information Disclosure Statement is a reference to the copies of

the five cited references. Applicant apologizes for any inconvenience occasioned by calling the reference copies "exhibits."

Applicant thanks the Examiner for the reminder of the duty of candor under 35 U.S.C. § 1.56.

B. Objection to the Specification

The Examiner has objected to the specification as containing an improper incorporation by reference (a copyright registration) and due to the fact that claims 27-29 are means-plus-function format claims.

Claims 27-29 have been canceled. The incorporation by reference has been deleted from the specification. Accordingly, Applicant respectfully submits that this objection has been overcome by amendment.

The Examiner has indicated that the incorporated material is essential subject matter. Applicant respectfully disagrees since this material is not essential to enable a person having ordinary skill in the art to make and use the claimed invention.

The Examiner has suggested that Applicant submit computer code corresponding to the cited copyright registration. Applicant respectfully demurs since such a submission would not appear to be probative of the enablement issue.

C. Rejection Under § 101

Claims 19-24 have been rejected under 35 U.S.C. § 101 as lacking patentable utility. In particular, the Examiner questions whether a "propagated signal" is a useful, concrete, and tangible result. This rejection is respectfully traversed based on the following arguments.

Applicant notes that claims 19-22 are directed to a computer program product, and thus, are not directed to a "propagated signal." The courts have recognized such computer program product claims as being a permissible way of claiming software embodied on a computer readable medium. Thus, Applicant respectfully requests that the Examiner carefully reconsider and withdraw this rejection as applied to claims 19-22.

Claims 23 and 24 have been amended, according to the Examiner's suggestion, to describe the invention in terms of a signal bearing medium instead of the "propagated signal" phrasing that was previously used. Thus, Applicant respectfully submits that this rejection has been overcome by amendment with respect to claims 23 and 24.

D. Rejection Under § 112, ¶ 1st - Written Description

Claims 1-35 have been rejected under 35 U.S.C. § 112, ¶ 1st as failing to meet the written description requirement. In particular, the Examiner notes concern whether the application as

filed evinced that Applicant had possession of the subject matter now claimed at the time the application was filed. This rejection is respectfully traversed based on the following arguments.

At the time of filing of this application, the invention was already being sold to customers as part of a working software product. Thus, Applicant had possession of the claimed subject matter. The Examiner has suggested that Applicant submit computer code corresponding to the cited copyright registration. Applicant respectfully demurs.

There is no doubt that the subject matter now claimed was regarded by Applicant as being the invention, at the time the application was filed, since claims as originally filed remain un-amended except for minor clarifying amendments.

E. Rejection Under § 112, ¶ 1st - Enablement

Claims 1-35 have been rejected under 35 U.S.C. § 112, ¶ 1st as failing to meet the enablement requirement. Specifically, the Examiner has expressed concern that the disclosure may not be sufficient for a person of ordinary skill in the art to make and/or use the claimed invention without resort to undue experimentation. This rejection is respectfully traversed based on the following arguments.

The law does not require that the no experimentation is

necessary in order to make or use the invention. The disclosure is not enabling only if undue experimentation is necessary to make or use the invention.

In order to aid the Examiner in determining the amount of experimentation that would be needed to make or use the invention, Applicant submits herewith evidence in the form of a Declaration under Rule 132.

The Declaration of industry expert Richard J. Rabbitz shows that it would take one or more persons of ordinary skill in the art (either in a solitary effort or working as a team) 440 man-hours to make and use the claimed invention based solely on the disclosure as filed and publicly available information.

The estimated software development time of 440 man-hours would not amount to undue experimentation. The U.S. Court of Appeals for the Federal Circuit has ruled that even 800 man-hours spent in developing a working system according to the teachings of a patent disclosure does not meet the level of undue experimentation. *Lindemann Maschinenfabrik GmbH* v. *American Hoist and Derrick Co.*, 730 F.2d 1452, 221 U.S.P.Q. 481 (Fed. Cir. 1984).

Accordingly, Applicant respectfully submits that claims 1-35 are enabled by the specification.

F. Rejection Under § 112, ¶ 2d - Indefiniteness

Claims 23 and 24 have been rejected under 35 U.S.C. § 112, ¶ 2d as being indefinite. Applicant thanks the Examiner for the thorough critique of the clarity of the claims. Claim 23 has been amended to rectify the antecedent basis errors noted by the Examiner. As to the meaning of the term "signal segments," Applicant wishes to make clear that this refers to segments of signal that correspond to a portion of a computer program embodied as a signal that is borne by a signal bearing medium.

Applicant respectfully submits that this rejection has been overcome by amendment.

G. Claim Interpretations

The portion of the Office Action discussing claim interpretation appears to be directed solely to claims 27-29. Claims 27-29 have been canceled. Accordingly, Applicant respectfully submits that this issue appears to be moot.

H. Absence of Prior Art Analysis

The Examiner has declined to analyze the claims with respect to the prior art, or to even search the prior art, for the reason that the claims are allegedly too indefinite and incomplete. Applicant respectfully submits that this approach is not appropriate and requests that the claims be fully examined, including search of the prior art and analysis with respect to

the prior art.

It is published policy of the U.S. Patent and Trademark Office to deny search in an application only in the case of applications so grossly informal as to be incomprehensible. *See* M.P.E.P. § 702.01 (8th ed. 2001). That clearly does not apply in the case of the present application, which conforms with requirements of 35 U.S.C. § 112, ¶ 1st, for the reasons discussed above. Piecemeal examination is against PTO published policy. *Id.* at § 707.07(g).

I. The Interview

Applicant thanks the Examiner for the courtesy extended in the interview of April 9, 2002. All issues raised in the Office Action were discussed. The Examiner confirmed that re-phrasing claims 23 and 24 to be in the form of "signal bearing medium" recitations would be favorably received. No agreement was reached on any other issues.

The Examiner was requested to re-consider the refusal to examine the application with regard to prior art. The Examiner declined to reverse his position during the interview.

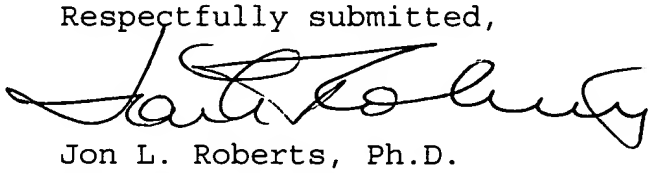
Closing

For the above reasons, Applicant respectfully submits that the application is in condition for allowance with claims 1-26 and 30-35. If there remain any issues that may be disposed of

via a telephonic interview, the Examiner is kindly invited to contact the undersigned at the local exchange given below.

The Commissioner is authorized to charge any necessary fees, and conversely, deposit any credit balance, to Deposit Account No. 18-1579.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please amend the paragraph at page 8, lines 14-23, as follows (underlining indicates insertions and brackets indicated deletions):

The present invention utilizes the graphical output of a satellite systems analysis program featuring high-resolution, three-dimensional, animated images of spacecraft, celestial bodies and other objects in the space environment. An example of such a satellite systems analysis program is the Satellite Tool Kit/Visualization Option (STK/VO) created by Analytical Graphics, Inc. of Malvern, Pennsylvania. STK/VO allows the user to select from a number of view perspectives -- such as satellite to Earth, satellite A to satellite B, facility to satellite, etc. -- depending on how many objects there are in the satellite system analysis scenario. [Copyright registrations for three versions of the Satellite Took Kit systems analysis program, cert. nos. TX4-819-009, TX4-819-010, and TX4-819-011, are hereby incorporated by reference in their entirety.]

IN THE CLAIMS:

Cancel claims 27, 28, and 29, and amend claims 1, 7, 13, 19, 23-25, 30 and 33 as follows (underlining indicates insertions and brackets indicated deletions):

1. *(Once Amended)* A process for sensor obscuration analysis, implemented via a programmable machine, the process comprising:

animating a three-dimensional visualization of a satellite that includes a sensor object, the sensor object having a boresight and a sensor pattern;

selecting a view perspective from the sensor object along the boresight;

selecting objects of a satellite system analysis scenario that are capable of causing obscuration;

assigning a first color to the selected objects; [, while assigning a second color to unselected objects and background of the satellite system analysis scenario;]

assigning [a third color] to the sensor pattern a color that contrasts with the first color, such that, when the sensor pattern is superimposed over a visual display of the satellite system analysis scenario, portions of the sensor pattern that overlap with unselected objects and background appear in a

different color than do portions of the sensor pattern that overlap with selected objects;

counting and recording the quantities of pixels of each color in the sensor pattern, the counting and recording being carried out at each time step of animation of the satellite system analysis scenario;

providing a graphical display to a user, during the animation, portraying the amount of obscuration of the sensor pattern, and source of obscuration of the sensor pattern, over a predetermined time period; and

calculating the percentage of obscuration over said predetermined time period on the basis of the recorded pixel quantities, the calculated percentage of obscuration being displayed to a user.

7. *(Once Amended)* A method of analyzing sensor obscuration using a satellite system analysis program having animated three-dimensional visualization of a satellite that includes a sensor object, the sensor object having a boresight and a sensor pattern, the method comprising:

selecting a view perspective from the sensor object along the boresight;

selecting objects of a satellite system analysis scenario that are capable of causing obscuration;

assigning a first color to the selected objects; [, while assigning a second color to unselected objects and background of the satellite system analysis scenario;]

assigning [a third color] to the sensor pattern a color that contrasts with the first color, such that, when the sensor pattern is superimposed over a visual display of the satellite system analysis scenario, portions of the sensor pattern that overlap with unselected objects and background appear in a different color than do portions of the sensor pattern that overlap with selected objects;

counting and recording the quantities of pixels of each color in the sensor pattern, the counting and recording being carried out at each time step of animation of the satellite system analysis scenario;

providing a graphical display to a user, during the animation, portraying the amount of obscuration of the sensor pattern, and source of obscuration of the sensor pattern, over a predetermined time period; and

calculating the percentage of obscuration over said predetermined time period on the basis of the recorded pixel quantities, the calculated percentage of obscuration being displayed to the user.

13. *(Once Amended)* A computer program product for enabling a computer to perform analysis of sensor obscuration, the computer program product comprising:

software instructions for enabling the computer to perform predetermined operations, and

a computer readable medium embodying the software instructions;

the predetermined operations comprising:

animating a three-dimensional visualization of a satellite that includes a sensor object, the sensor object having a boresight and a sensor pattern;

selecting a view perspective from the sensor object along the boresight;

selecting objects of a satellite system analysis scenario that are capable of causing obscuration;

assigning a first color to the selected objects; [, while assigning a second color to unselected objects and background of the satellite system analysis scenario;]

assigning [a third color] to the sensor pattern a color that contrasts with the first color, such that, when the sensor pattern is superimposed over a visual display of the satellite system analysis scenario, portions of the sensor pattern that overlap with unselected objects and background

appear in a different color than do portions of the sensor pattern that overlap with selected objects;

counting and recording the quantities of pixels of each color in the sensor pattern, the counting and recording being carried out at each time step of animation of the satellite system analysis scenario;

providing a graphical display to a user, during the animation, portraying the amount of obscuration of the sensor pattern, and source of obscuration of the sensor pattern, over a predetermined time period; and

calculating the percentage of obscuration over said predetermined time period on the basis of the recorded pixel quantities, the calculated percentage of obscuration being displayed to the user.

19. *(Once Amended)* A sensor obscuration analysis computer program product, which has a computer program stored on a machine-readable medium, the computer program comprising:

an animation code segment providing for animated three-dimensional visualization of a spacecraft having a sensor object, the sensor object having a boresight and a sensor pattern;

a perspective selection code segment providing for a visualization view from the perspective of said sensor object, along said sensor object's boresight;

a selection code segment that enables selection of obscuring objects to be taken into account in the obscuration analysis;

a simplification code segment that simplifies visual display provided by said animation code segment to show the selected obscuring objects in a first color; [and show unselected objects and background in a second color;]

a distinguishing code segment that assigns a [third] second color to portions of the sensor object's field of view that are obscured by the selected obscuring objects and a [fourth] third color to those portions of the sensor object's field of view that are not obscured, to thereby distinguish obscured portions of the sensor object's field of view from unobscured portions of the sensor object's field of view;

a quantifying code segment that counts and records a quantity of pixels corresponding to obscured portions of the sensor object's field of view at each of plural animation time steps, and that counts and records a quantity of pixels corresponding to unobscured portions of the sensor object's field of view at each of the plural animation time steps; and

a results code segment that calculates, based on the quantities of pixels counted and recorded by said quantifying code segment, and reports to a user percent obscuration of the sensor object's field of view over a predetermined time period.

23. *(Once Amended)* A [propagated] signal bearing medium propagating a signal for use in sensor obscuration analysis, [the signal being propagated via a data transmission medium,] the signal propagated via the signal bearing medium comprising:

an animation signal segment providing for animated three-dimensional visualization of a spacecraft having a sensor object, the sensor object having a boresight and a sensor pattern;

a perspective selection signal segment providing for a visualization view from the perspective of said sensor object, along said sensor object's boresight;

a selection signal segment that enables selection of obscuring objects to be taken into account in the obscuration analysis;

a simplification signal segment that simplifies visual display provided by said animation [code] signal segment to show the selected obscuring objects in a first color; [and show unselected objects and background in a second color;]

a distinguishing signal segment that assigns a [third] second color to portions of the sensor object's field of view that are obscured by the selected obscuring objects and a [fourth] third color to those portions of the sensor object's field of view that are not obscured, to thereby distinguish obscured portions of the sensor object's field of view from

unobscured portions of the sensor object's field of view;

a quantifying signal segment that counts and records a quantity of pixels corresponding to obscured portions of the sensor object's field of view at each of plural animation time steps, and that counts and records a quantity of pixels corresponding to unobscured portions of the sensor object's field of view at each of the plural animation time steps; and

a results signal segment that calculates, based on the quantities of pixels counted and recorded by said quantifying [code] signal segment, and reports to a user percent obscuration of the sensor object's field of view over a predetermined time period.

24. *(Once Amended)* The [propagated signal for use in sensor obscuration analysis] signal bearing medium of claim 23, the signal propagated via the signal bearing medium further comprising:

a projection signal segment that projects said sensor pattern from edges of said sensor object.

25. *(Once Amended)* A computer system adapted to analyze sensor obscuration, comprising:

a processor, and

a memory including software instructions adapted to enable

the computer system to perform operations comprising:

animating a three-dimensional visualization of a satellite that includes a sensor object, the sensor object having a boresight and a sensor pattern;

selecting a view perspective from the sensor object along the boresight;

selecting objects of a satellite system analysis scenario that are capable of causing obscuration;

assigning a first color to the selected objects; [, while assigning a second color to unselected objects and background of the satellite system analysis scenario;]

assigning [a third color] to the sensor pattern a color that contrasts with the first color, such that, when the sensor pattern is superimposed over a visual display of the satellite system analysis scenario, portions of the sensor pattern that overlap with unselected objects and background appear in a different color than do portions of the sensor pattern that overlap with selected objects;

counting and recording the quantities of pixels of each color in the sensor pattern, the counting and recording being carried out at each time step of animation of the satellite system analysis scenario;

providing a graphical display to a user, during the animation, portraying the amount of obscuration of the sensor pattern, and source of obscuration of the sensor pattern, over a predetermined time period; and

calculating the percentage of obscuration over said predetermined time period on the basis of the recorded pixel quantities, the calculated percentage of obscuration being displayed to the user.

27. *(Cancelled)*

28. *(Cancelled)*

29. *(Cancelled)*

30. *(Once Amended)* A method of upgrading a satellite system analysis program that performs animated three-dimensional visualization of a satellite, the satellite having a sensor object, the sensor object having a sensor pattern and a boresight, the method comprising:

supplementing the available view perspectives for the satellite system analysis program so as to include a view from the sensor, along the boresight of the sensor;

supplementing the satellite system analysis program with a code segment that enables a user to select objects to be taken into account for analysis of obscuration of the sensor pattern as

viewed along the boresight of the sensor;

supplementing the satellite system analysis program with a code segment that simplifies visual display, as viewed along the boresight of the sensor, to show selected objects in a first color; [and unselected objects and background in a second color;]

supplementing the satellite system analysis program with a code segment that assigns colors to a representation of the sensor pattern of the sensor object, so as to distinguish those portions of the sensor object's field of view that are obscured by selected objects from those portions of the sensor object's field of view that are not obscured by selected objects;

supplementing the satellite system analysis program with a code segment that counts and records the quantity of pixels corresponding to obscured and unobscured portions of the sensor object's field of view at each of plural animation time steps; and

supplementing the satellite system analysis program with a code segment that calculates, based on recorded quantities of pixels corresponding to obscured and unobscured portions of the sensor object's field of view at each of plural animation time steps, an obscuration percentage over a predetermined time period, the results of the calculations being reported to a user.

33. *(Once Amended)* A computer program product for enabling

a computer to upgrade a satellite system analysis program that performs animated three-dimensional visualization of a satellite, the satellite having a sensor object, the sensor object having a sensor pattern and a boresight, the computer program product comprising:

software instructions for enabling the computer to perform predetermined operations, and

a computer readable medium embodying the software instructions;

the predetermined operations comprising:

supplementing the available view perspectives for the satellite system analysis program so as to include a view from the sensor, along the boresight of the sensor;

supplementing the satellite system analysis program with a code segment that enables a user to select objects to be taken into account for analysis of obscuration of the sensor pattern as viewed along the boresight of the sensor;

supplementing the satellite system analysis program with a code segment that simplifies visual display, as viewed along the boresight of the sensor, to show selected objects in a first color; [and unselected objects and background in a second color;]

supplementing the satellite system analysis program with a code segment that assigns colors to a representation of the

sensor pattern of the sensor object, so as to distinguish those portions of the sensor object's field of view that are obscured by selected objects from those portions of the sensor object's field of view that are not obscured by selected objects;

supplementing the satellite system analysis program with a code segment that counts and records the quantity of pixels corresponding to obscured and unobscured portions of the sensor object's field of view at each of plural animation time steps; and

supplementing the satellite system analysis program with a code segment that calculates, based on recorded quantities of pixels corresponding to obscured and unobscured portions of the sensor object's field of view at each of plural animation time steps, an obscuration percentage over a predetermined time period, the results of the calculations being reported to a user.